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A case of rapidly expanding tuberculous lung cavity after bronchoscopy

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A non-smoking Asian woman with previously treated pulmonary tuberculosis presented with a recent onset unproductive cough and cavitating mass lesion on her chest X-ray which rapidly developed into a large tuberculous cavity after bronchoscopy. Acid-fast bacilli were isolated from the cavity and she responded very rapidly to standard anti-tuberculous chemotherapy. This unusual condition must be considered in patients who deteriorate after bronchoscopy.

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Introduction

The incidence of tuberculosis (TB) is increasing world-wide, and TB remains a significant health problem with notification rates in England and Wales continuing to rise despite significant under-reporting (1). The present case report describes a case of pulmonary TB in a woman previously treated with combined chemotherapy, who deteriorated suddenly with development of a rapidly expanding tuberculous lung cavity after bronchoscopy, and then promptly responded to standard triple anti-TB chemotherapy.

Case Report

A 65-year-old non-smoking woman, originally from India, presented in November 1994 with a 2-month history of an unproductive cough, fatigue and weight loss of 4 kg. She had no other symptoms of note but a past history of presumed pulmonary TB in 1979, treated at another hospital. At that time, her chest X-ray showed a right upper lobe cavitating opacity but no sputum specimen was obtained. She was treated empirically with a 9-month course of combined anti-tuberculous chemotherapy (rifampicin and isoniazid) which led to complete resolution of her radiological abnormality. Physical examination was unremarkable except she appeared generally unwell. Her chest X-ray showed a cavitating mass lesion in the apical segment of the right lower lobe [Plate 1(a)]. No sputum could be obtained. She proceeded to an uneventful day case fibre-optic bronchoscopy on 10 November 1994 which showed no abnormality. Brushing and washing of the apical segment of the right lower lobe was performed, but these yielded no malignant cells or acid-fast bacilli.

The patient became ill a few hours after bronchoscopy, and at the follow-up outpatient clinic on 17 November 1994, she reported new symptoms of fever, rigor and anorexia. There was no chest pain, sputum production or haemoptysis. On examination, she had a temperature of 39°C and clinical dehydration. There were bronchial breath sounds and crackles on the right side of her chest, but no other significant abnormality. White blood cell count was $18{\cdot}2 \times 10^9\ ml^{-1}$ with predominantly neutrophilia, Hb was 11·3 g dl^{-1}, and blood culture was negative. Her chest X-ray [Plate 1(b)] showed considerable expansion of the previously noted cavity which became thin-walled. She was commenced on intravenous fluid, standard anti-TB chemotherapy (rifampicin, isoniazid and pyrazinamide), cefotaxine and metronidazole.

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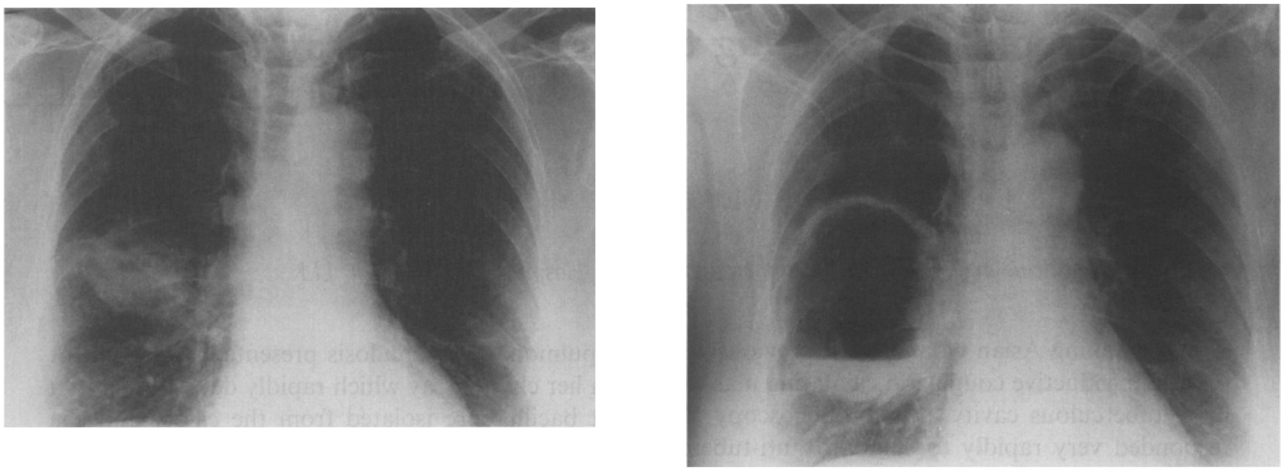

PLATE 1. Chest X-rays (PA view) from the patient showing (a) a cavitating mass lesion in the apical segment of the right lower lobe, and (b) a thin wall large cavity in the right hemi-thorax with a fluid level (film taken 2 weeks after bronchoscopy).

After overnight treatment, she underwent a percutaneous aspiration of the abscess cavity under fluoroscopy, and this produced thick non-foul-smelling green pus. Smear of the aspirate showed numerous acid-fast bacilli and some Gram-positive cocci, but no malignant cells. She was continued on standard anti-TB chemotherapy. Subsequent culture of the aspirate showed a moderate growth of α-haemolytic streptococcus. Her anti-neutrophil cytoplasmic antibodies and other auto-antibody screen were negative. On the above regime, her fever settled after 3 days. A computerized tomographic scan of her thorax confirmed the presence of the apical segment cavity, and showed three small upper para-mediastinal lymph nodes but no other significant abnormality. The patient improved rapidly and was discharged 10 days after admission. Culture of the aspirate yielded *Mycobacterium tuberculosis* which was fully sensitive to standard anti-TB drugs. The patient continued to improve and at review in June 1995, eight months after initial presentation, her chest X-ray showed complete resolution of the cavity.

Discussion

Despite conventional combined chemotherapy for sensitive TB in compliant patients, re-activation of pulmonary TB still occurs in less than 5% of patients (2). Re-activation usually occurs within 10 yr of the primary infection (3), and affects the apical and posterior segment in 85% and apical segment of lower lobe in 9·5% of pulmonary cases (4). The presence of intra-thoracic lymphadenopathy was also found in 5% of patients with re-activation TB (5).

This patient presented with pulmonary TB of the right lower lobe in the form of a tuberculoma. Her deterioration appeared to stem from the bronchoscopy. Bronchoscopy is usually a safe and effective procedure which can provide diagnostic information in 20–45% of patients with active pulmonary TB who otherwise have no bacteriological proof (96). The other isolate from the cavity aspirate was α-haemolytic streptococcus which is not usually associated with formation of lung abscess or gas-forming (7). Necrosis of the tuberculoma leading to the formation of a fluid-containing cavity could have occurred spontaneously or secondary to the bronchoscopic procedures. However, this does not usually expand in such a rapid manner (8). It is most likely that the formation of the rapidly expanding lung cavity might have been due to brushing and washing of the right lower lobe apical segment during bronchoscopy. Physical disturbance of a cavitating pulmonary mass lesion can lead to air trapping by a ball valve effect which plays an important role in the formation of pneumatoceles (9). The absence of gas-forming organisms in the culture of the lung aspirate also supports this proposed mechanism, although TB lung cavities can also expand *de novo* if impairment of drainage or development of tension occurs (8).

This case report highlights the rare development of a rapidly expanding TB lung cavity which occurred after bronchoscopy. This condition should be recognized and prompt antituberculous therapy should be instituted in similar cases.

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